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Application No. 10/754,390

SEP 15 2006

Reply to Office Action

*REMARKS/ARGUMENTS**The Pending Claims*

Claims 1-21 are pending. Claims 1-17 are directed toward a polishing pad comprising a porous polymeric material, wherein the porous polymeric material has a negative Poisson's ratio. Claims 18-21 are directed toward a method of polishing with the aforementioned polishing pad. Reconsideration of the claims is respectfully requested.

*Summary of the Office Action*

Claims 1-21 stand rejected under 35 U.S.C. § 103(a) as allegedly obvious over Reinhardt (i.e., U.S. Patent 6,095,902) in combination with Lakes (i.e., U.S. Patent 4,668,557) and Lombardo et al. (i.e., U.S. Patent Publication 2004/0248508), alone or in further combination with Sevilla et al. (i.e., U.S. Patent 6,126,532), Suzuki et al. (i.e., U.S. Patent 6,120,353), Osterheld et al. (i.e., U.S. Patent 6,241,596), and Tang (i.e., U.S. Patent 5,949,927).

*Response to the Obviousness Rejections*

As is well-settled, in order to establish a *prima facie* case of obviousness with respect to a claim, three criteria must be met: (1) the prior art references must suggest to one of ordinary skill in the art to make the subject matter defined by the claims in issue, (2) the prior art references must provide one of ordinary skill in the art with a reasonable expectation of success in so making the subject matter defined by the claims in issue, and (3) the prior art reference (or references when combined) must teach or suggest all the claim limitations. Both the suggestion and the reasonable expectation of success must be found in the prior art references, not in the disclosure of the patent application in issue. See, e.g., *In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991).

Applicants respectfully traverse the obviousness rejections for two reasons: (1) the cited references provide no motivation to lead a person of ordinary skill in the art to modify the pads disclosed therein in such a way as to arrive at the invention defined by the pending claims and (2) the cited references provide no reasonable expectation that the combination of the disclosures of the cited references would be successful.

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Reinhardt generally discloses cellular polishing pads comprising polyether and/or polyester polyurethanes. However, as acknowledged in the Office Action, Reinhart fails to disclose or suggest a cellular polishing pad comprising a polymeric material with a Poisson's ratio of less than zero, as recited in the pending claims. Moreover, Lakes fails to teach the use of negative Poisson's ratio material in the production of polishing pads. Rather, Lakes discloses the use of negative Poisson's ratio material in cushions, plugs, air filters, shoe soles, sandwich panels, humidifier belts, sound absorbers, sponges, gaskets, and medical supplies (col. 4, line 47, through col. 6, line 2). Nevertheless, the Office Action asserts that, since Lakes teaches that polymeric foams with a negative Poisson's ratio "would be more advantageous than conventional foam materials in applications where *superior* strength and abrasion resistance are desired along with a compliant foam" (col. 4, line 68, through col. 5, line 3), and Lombardo teaches that *sufficient* abrasion resistance is a desirable property for a polishing pad (paragraph 0043), it would have been obvious to one of ordinary skill in the art to replace the conventional foam of Reinhardt with a polyurethane having a negative Poisson's ratio (emphasis added).

However, there is nothing in Reinhardt to teach or suggest that the polishing pads comprising polyether and/or polyester polyurethanes would benefit from the *increased* abrasion resistance reportedly achieved by converting these foams into negative Poisson's ratio materials. In other words, there is no suggestion in any of the cited references that the polishing pads of Reinhardt have less than *sufficient* abrasion resistance for good polishing activity and should be replaced with another material.

Moreover, no reasonable expectation of success for a modification of the polishing pads of Reinhardt can be found in the cited references. As mentioned above with respect to Lombardo, polishing pads must exhibit sufficient abrasion resistance to function in a polishing operation. However, as is known to one of ordinary skill in the art, polishing pads quickly lose the ability to polish due to the build up of slurry and removed wafer material on the surface of the polishing pad. See, for example, U.S. Patent 6,500,054 (Ma et al.) at col. 1, lines 64-66, and U.S. Patent 6,234,868 (Easter et al.) at col. 1, lines 29-41. Consequently, in order to maintain polishing activity, the polishing pad must be conditioned to remove build up and to roughen the polishing surface (Ma et al., col. 2, lines 1-3, and Easter et al., col. 1, lines 52-56). Conditioning is carried out by driving an abrasive, such as diamonds, against

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the polishing pad to remove slurry and polishing pad material (Easter et al., col. 1, lines 46-56). In such a manner, the polishing surface of the polishing pad is repeatedly regenerated by abrading away material, including the pad material itself. A polishing pad comprising a foam material with too much abrasion resistance could not be adequately conditioned and would lose polishing activity. As such, the cited references do not provide a reasonable expectation of success that a polishing pad comprising the polyether and/or polyester polyurethanes of Reinhardt modified to have a negative Poisson's ratio would have the appropriate level of abrasion resistance for good polishing activity.

Accordingly, the Office Action fails to point to any teaching or suggestion available to those of ordinary skill in the art at the time of the invention that would have motivated one of ordinary skill to combine the disclosure of Lakes with the disclosures of Lombardo and Reinhardt in such a way as to arrive at the invention defined by the pending claims. Moreover, there is no reasonable expectation of success attendant in the combination of the disclosures of the cited references. For either reason, let alone both reasons, the pending claims cannot properly be considered *prima facie* obvious over the cited references. The rejection under Section 103, therefore, is improper and should be withdrawn.

#### Conclusion

Applicants respectfully submit that the patent application is in condition for allowance. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

  
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